An Urbanism oriented towards rail in Germany and France: selected findings of the Bahn.Ville project

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AN URBANISM ORIENTED TOWARDS RAIL IN GEMANY AND FRANCE: SELECTED FINDINGS OF THE BAHN.VILLE PROJECT

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ABSTRACT

Transit oriented development has become in the recent years a topic of high interest both for researchers and for practitioners. The French-German project Bahn.Ville 2 has the objective of testing the principles of an urbanism orientated towards rail by implementation on two regional railway lines (St. Etienne – Firminy, Lyon metropolitan region as well as Taunusbahn, Frankfurt/Rhein-Main region). This paper is presenting selected results on

- innovations in regional planning instruments in France (Schéma de Cohérence Territorial) and Germany (Regionaler Flächennutzungsplan) and their respective for a better integration of land-use and transport,
- specific observations on neighbourhood mobility in the station surrounding and propositions for high quality walking environments as well as
- the potential of an observation tool designed to support public intervention on land-use and transport around stations.

The results constitute three original contributions of the Bahn.Ville 2 project in the sense of the support sustainable mobility by an urbanism orientated towards rail.

Keywords: transit-oriented development, regional planning instruments, local neighbourhood mobility, processes of implementation

BACKGROUND

Bahn.Ville - a French-German collaboration on rail-oriented urban development

Designing or redesigning cities around rail has become in the recent years a topic of high interest both for researchers and for practitioners.

A major French-German action research project has been run in order to develop successful strategies in integrating land-use and transport around attractive regional railways. The Bahn.Ville program in a first phase from 2001 to 2004 has analysed the various interactions of railway supply ("Bahn") and urban development ("Ville") around the railway stations (".") by best-practice analysis and exhaustive empirical investigations on four case studies: the regional rail network of Strasbourg and the Nantes - St. Nazaire link in France as well as the "Voreifelbahn" (Bonn - Euskirchen) and the "Bodensee-Oberschwaben-Bahn" (Friedrichshafen – Ravensburg – Aulendorf) in Germany (see Wulfhorst et al, 2002). The findings and general recommendations on rail oriented development and intermodality have been summed up in a French-German guideline (Bahn.Ville, 2005). All working papers and communications of this first phase are presented at the project website www.bahn-ville.net.

From the beginning of the research and development project, co-financed within the DEUFRAKO program by the German and French ministries responsable for mobility research (see www.deufrako.org), a second phase of experimental implementation of innovative strategies and measures on two reference sites has been foreseen.

Finally, the Firminy – St. Etienne rail line in the Lyon metropolitan area (Region Rhône-Alpes) as well as the Taunusbahn (Bad Homburg – Brandoberndorf) in the Frankfurt/Rhine-Main region (Land Hessen) turned out to be suitable sites for experimenting and testing the various aspects of rail-oriented urban development. Contrasting in many framing conditions (length of the line, demographic/economic development, urban patterns,…) one of the key ideas of the Bahn.Ville 2 project is to demonstrate the success factors of rail-oriented development in order to make them transferable to other regions through-out Europe.

Figure 1 – the "Bahn.Ville approach" – integrating regional railway supply with station development and transit oriented development (photo credits: Pretsch, 2007)

Objectives of the paper

On the background of the research findings and practice experiences within the Bahn.Ville project, two major levels of action for sustainable mobility can be distinguished:

a) The level of the urban region, to be taken in account for strategies in integrating the different modes of transportation in order to improve the concurrence situation between rail and road supply as well as in order to promote the regional railway system as the backbone for territorial development
b) The level of the urban neighbourhood as the major local planning level in order to foster transit-oriented development of housing, business locations and services as well as to improve the conditions for slow modes (especially walking and cycling) in the station surrounding.

The purpose of this paper, in consequence, is to present selected findings of the Bahn.Ville research program conducted between 2007 and 2010 in France and Gemany, with a focus on processes and operational tools on the above mentioned levels of action.

Firstly, the results of comparing the innovative planning instruments on the level of urban regions in France (SCOT - Schéma de Cohérance Territoriale) and Germany (RegFNP - Regionaler Flächennutzungsplan) will show the potential, shortcomings and perspectives of regional planning towards rail-oriented development.

Then, knowledge and experience gathered in the field of neighbourhood mobility will be presented, based on detailed qualitative surveys accompanying rail users on their way from and to the station as well as on results from workshops with school children and planning

experts. Criteria for high quality pedestrian networks in the station area are set up in a common French-German conclusion.

Last but not least the implementation of a land-use observatory is analysed enabling local public bodies to be aware of real estate transactions, so that they can decide to make use of their pre-emption rights within a given perimeter in order to invest in strategic urban functions within the station area.

Further aspects of the Bahn.Ville project, like the methods of accessibility modelling or the mobility management strategies on specific target groups (non-users, elderly people or new residents) will be discussed in other related WCTR papers (e.g. Stoiber, Mercier, 2010) as well as on the closing conference (to be held 01/02 July in the Frankfurt region, cf. www.bahn-ville2.de; information on the French project part is available on www.bahn-ville2.fr).

Finally, conclusions and perspectives will be drawn on the potential of rail-oriented development towards sustainable mobility.

REGIONAL PLANNING INSTRUMENTS FOR A BETTER INTEGRATION OF LAND-USE AND TRANSPORT

A comparison on new tools in France and Germany

Firstly, we present a comparison of new regional planning tools in Germany (RegFNP) and France (SCOT) and their respective ability to foster and support the principles of the development of a rail orientated city-region.

Both instruments meet the concerns of structural changes impacting spatial development and transport planning by inter-municipal cooperation. However, the chosen planning tools differ extremely in form, process and implementation issues.

Whereas the German specifications are precise in determination of processes, plan appearance, scale and contents carried out by a planning association, the French approach is a more flexible tool oriented on a framework of guidelines, enabling strategic cooperation but giving the responsibility of implementation to the municipalities themselves.

Implications on the respective processes on developing integrated land-use and transport measures will be discussed.

The analyse of the two planning instruments, being the "*Regionaler Flächennutzungsplan*" (RegFNP), a regional land-use plan, and the "*Schéma de coherence territorial*" (SCOT), an integrated strategy on the level of urban regions, will focus on the specific instrument of the chosen reference sites, which are in Germany the RegFNP in the Frankfurt/Rhein-Main region and in France the SCOT Sud-Loire in the St. Etienne region.

The results have been deducted from literature analysis (e.g. CERTU, 2008; Altenburger et al., 2007), however only of descriptive not evaluative nature, comparisons of the respective planning material and processes as well as on deepened expert interviews in both regions.

Key aspects of comparison

Legislative background and general framework conditions

In general the given law marks the start of distinctions between the two inter-municipal planning instruments. By law (loi SRU "loi relative à la solidarité et au renouvellement urbains, 2001 in combination with "code le l'urbanisme"), French agglomerations of more than 50.000 inhabitants are forced to install a SCOT, if they intend to develop. This combined

with a rather flexible legal framework generates a lot of experience with the instrument in France and a wide range of SCOT-forms in size and content (more than 200 SCOT's).

Compared to the german RegFNP, maps remain symbolical, are not of strongly binding character and thus cause less strictness concerning the implementation. However this leaves space for great ideas, for instance giving concrete good examples for intermediate housing in a refreshing clear text document in the case of SCOT Sud Loire. The SCOT Sud-Loire regroups 117 municipalities and has been set up from 2004 (set-up decision) to 2009 (approval).

The level of quality and detail of the elaborated SCOTs also varies by the size of the agglomerations. While small municipalities hire a local agency to work out a SCOT, the more important agglomerations can rely on a well prepared local/regional administration, the so-called "agencies d'urbansime" (e.g. EPURES in the St. Etienne metropole) to work out a sophisticated conceptual scheme.

In Germany, the maps of the RegFNP Rhein-Main are not only the core element of the further development with answers for structural questions and the only binding document for the involved municipalities, but claim equality in contents and appearance. Since 1998 the Federal Regional Planning Act opens the possibility to form a planning community in form of the RegFNP to foster the regional economic well-fare. However, it implies a re-organisation and re-adjustment of existing planning levels, including an abdication of municipal planning rights (the preparatory land-use plan) in favour of regional adjustment, strictness in the future settlement development and a lot of planning and administrative work. Additionally, the option the implement this new instrument requires an additional legislative procedure at the level of the Länder. These arguments are the reason for by now only two RegFNPs in Germany.

Besides the RegFNP of the region Rhein-Main analysed in detail, the Rhine-Ruhr region also is establishing a common land-use planning scheme on the regional level. The RegFNP Rhein-Main regroups 75 municipalities; with a set-up decision taken in 2003 it actually has a draft status and will probably be approved by the ministry of Hesse by the end of 2010.

Political power

The political power of the respective municipal councils or majors, being democratic representatives of the local scale as well as their involvement in the regional planning process, has decisive influence in France as well as in Germany. However, this effect comes to scene on different stages of the planning process.

Whereas in the RegFNP Rhein-Main politic intervention is strong in the development of the plan, for example with reference to the decisions for land-use rights of particular plots or areas, the local French politicians are not individually involved in the process of elaborating a SCOT. Their will and commitment becomes important in the implementation process where

they are still able to decide where and what to build; in a stage where German politicians are bound to the already fixed strategy on the local level.

This is mainly due to the fact, that the German RegFNP replaces the manifold preparatory land-use plans ("Flächennutzungsplan") which formulate the specific land-use rights on the municipality level and lead to the binding land-use plans ("Bebauungsplan"), whereas the French SCOT rather represents an integrated regional strategy, that afterwards is translated to local urban plans for each municipality (PLU plan local d'urbanisme).

Parameters for structuring the settlement patterns

One of the main issues to make rail-bound mobility attractive and efficient is the determination of the settlement areas. Both planning instruments have diverse approaches.

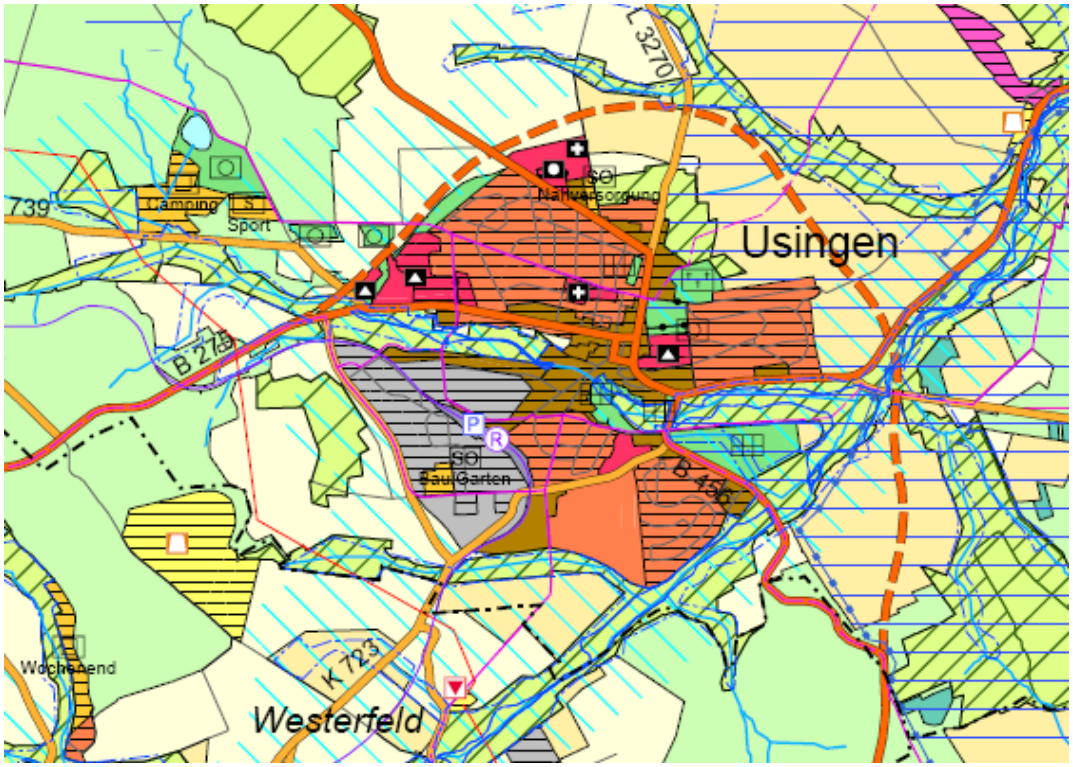

Figure 2: Level of detail in land-use functions allocated in the RegFNP
(Source: Planungsverband, 2009)

The SCOT Sud Loire makes a differentiation between light grey coulored areas to mark areas already constructed with a buffer of 200 meters and dark grey to mark the so-called constructible envelope.

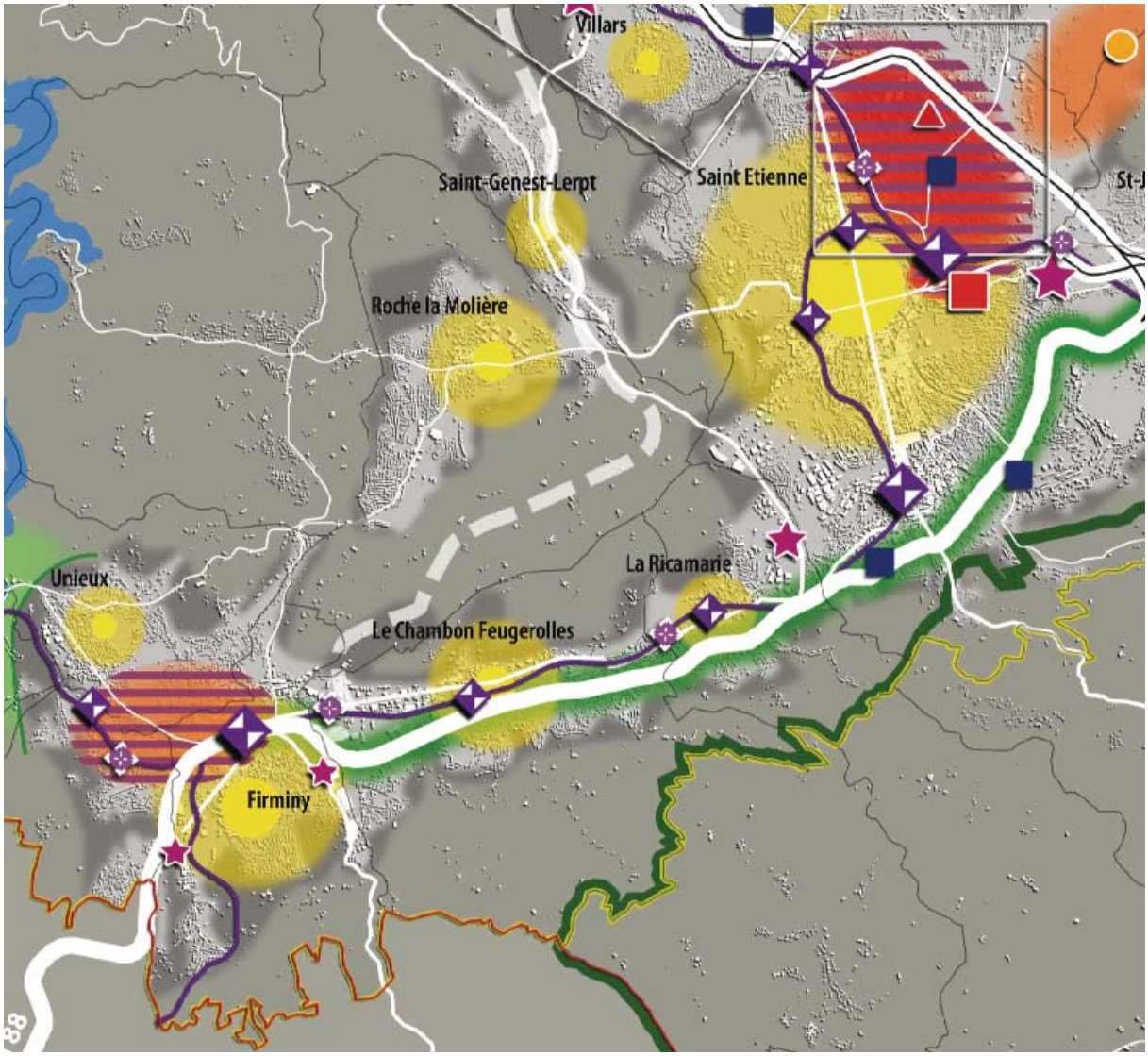

Figure 3: Spatial development orientations given by the SCOT Sud Loire (Source: www.scot-sudloire.fr)

Within the dark grey zones - if respecting *a minimum of density* and the contingent for the municipality - the decision to build and what to build is made by the major. Compared with the German RegFNP there are more options and more flexibility in the settlement development within SCOTs. German municipalities are forced to build exactly on the plot and in conformity to the determined urban function fixed by the RegFNP.

Scales and levels of detail

The RegFNP appoints exact plots and their use which have to be marked in a way specified by law according to the "Flächennutzungsplan" (preparatory land-use plan) and the "Regionalplan" (regional plan), two formal planning instruments which are replaced by the RegFNP. Itself being very formal, the RegFNP does not leave space for interpretation.

In France, the level of detail is much lower. In order to fix the settlement development, the SCOT Sud Loire is providing a specific instrument controlling the settlement allocation only by a hectar-contingent determined by groups of municipalities as the maximum to be developed in the constructible envelope, a quota to be realised within the "constructed area" (which is the 200 meters radius), and a minimum of density which has to be realised for new settlements, depending on the level of centrality the municipality shows.

Intermediate conclusions

The comparison of regional planning tools in Germany (RegFNP) and France (SCOT) shows their respective ability to foster and support the principles of the development of a rail orientated city-region.

Both instruments meet the concerns of structural changes impacting spatial development and transport planning by intermunicipal cooperation. However the chosen planning tools differ extremely in form, process and implementation issues. Whereas the German specifications are precise in determination of processes, plan appearance, scale and contents carried out by a planning association, the French approach is a more flexible tool oriented on a framework of guidelines, enabling strategic cooperation but giving the responsibility of implementation to the municipalities themselves.

The contribution of RegFNP and SCOT to the "Bahn.Ville approach" is first of all the deeper insight in the exigency of inter-municipal collaboration and planning, the consideration of the interactions in the outcome of the own municipal land-use planning and the planning of neighbour municipalities referring to the rail oriented development. Furthermore there is the understanding of the necessity of the local policies not to stop thinking with the geographic municipal border included in the planning process of both instruments.

The instruments turn to be the right approach to foster more rail orientation; however, they still need to be optimised. The formal elements stated by the law have to be strengthened in direction of stronger regional competences, however embodied in more municipal participation in the same time. On the other hand the informal spirit of thinking regional has to arise.

NEIGHBOURHOOD MOBILITY

Linking proximity and distance by a walk to the railway station

Neighbourhood mobility turns out to be a key element in supporting rail-oriented development. High quality in planning for non-motorised transport modes, a vitality and diversity of urban functions in the station surrounding as well urban design principles are of importance to foster the "Bahn.Ville approach".

There seems to be a double-faced objective to link the fast railway system with the slow modes in the direct surrounding. A controversy could be pointed out by this couple of proximity and distance dealing with local attractiveness as well as with short distances and soft modes on the one hand, linked to the fast rail track by the station hubs. But attractive regional railway systems typically show their spatial impacts within the close surrounding of the stations. In general, up to 50% of all train users come on foot or by bike to the station Especially in France, the pedestrian access to the station somehow is rediscovered recently.

In addition the regional approaches, that we have seen before, the local level therefore is the second important level of analysis and action.

Major investigations have been realised in the French and German case-study on user's perceptions by observations, interviews and workshops with frequent users. Some results and recommendations are presented in the following

"Luxurious" footpaths in France

Methodological approach

Based on the French case-study, one of the objectives concerning neighbourhood mobility is to draw a territorial diagnostic of certain urban spaces, considered here from a very specific point of view : urban spaces as support (material, perceptible, sensitive) for pedestrian progress towards rail stations.

Two complementary approaches were implemented in this diagnostic based on investigations in Carnot and Le Clapier station surroundings in Saint-Etienne:

a) The point of view of the pedestrians themselves as daily users, who walk through these urban spaces on a regular basis and who therefore are supposed to have a great « empirical knowledge » of their footpath. A survey via questionnaires (including open questions on the perception that users have of their walking towards the station) was conducted as an attempt to bring this knowledge in light.

b) The point of view of a « specialist » (urbanist-architect-researcher), who previously didn't know this site, but who is supposed to be able to formulate an opinion at the conclusion of his own territorial investigation. For this purpose, he walked along every footpath covered by all persons questioned during the first approach.

In order to facilitate the confrontation between these two points of view, one single « frame of reference » has been implemented as a support for both the elaboration of the questionnaires (first approach) and the « observations grid » used by the specialist (second approach). This common frame takes as a basis a pre-existing « spatial analysis matrix » (Strasnky, 2006). Besides the diagnostic itself, the purpose of this methodology was to lead to specific guidelines for improving the rail station attractiveness.

Quality as a basic requirement for attractiveness

The pre-assumption of the study is that such attractiveness depends – not only, but also – on the « quality » of the footpath leading towards the station. In other terms, we suppose that a person will be (strongly?) in favour of using the railway system if the « walking conditions » offered to get to (and from) the station are « luxurious ». We use this term – which may seem rather excessive – because we are seeking the competition to the individual car; and luxury refers to one of the principle reasons for the predominance of the personal car. However, luxury obviously – as a result of our observations – doesn't have the same significance for the car driver and for the pedestrian. From the point of view of the latter, it refers to what we consider as being the « basic properties » of a correctly designed footpath, ideally all along the trip, but in any case (imperatively) on its terminal part (including the immediate surroundings of the station and the station itself).

Criteria for good walking conditions

A user's legitimate aspirations during his trip are, *a minima*, to have the possibility to move in a nice environment, without interruptions, obstacles, detours or clashes, in peace and without any danger, walking along a minimum of services and shops useful for him, towards a destination (the station) clearly identifiable and which can be easily spotted from a distance.

In consequence, five basic criteria have been dressed:

1. *Atmosphere*: « in a nice environment »
2. *Fluidity*: « without interruptions, obstacles, detours or clashes »
3. *Security (and safety)*: « in peace and without any danger »
4. *Services (offer)*: « walking along a minimum of services and shops useful for him »
5. *Readability*: « towards a destination (the station) clearly identifiable and which can be easily spotted from a distance ».

The results of the observation *in situ* – case studies investigations based on the spatial analysis matrix mentioned before – show that in terms of « territorial deficiencies » as well as

of « territorial assets », a « minimum degree of luxury » can be obtained, if all of these five criteria are reasonably fulfilled. For instance, having the possibility to walk in an environment perceived (visually, auditory, olfactory,…) as pleasant (first criterion) may contribute – as well as each of the four other criteria – to make a car user change his travel mode, at least for accessing the railway station.

But *a contrario*, a deficiency relative to only *one* among these criteria is, according to this hypothesis, sufficient to make a footpath inadequate for the purpose of a « rail oriented urbanism ». Therefore, the five criteria directly lead to a proposal of five « planning principles », which consist in correcting (by different means) every severe deficiency and in taking advantage of every asset, both in terms of atmosphere, fluidity, security, service offer *and* readability.

Consequences for the case-study application

The territorial diagnostic of the specific case-study in the St. Etienne region leads to recommendations that may roughly be summed up as follows:

- At Carnot, the main deficiencies are relative to the station itself (architecture, absence of readability…) and its immediate surrounding (lack of maintenance, « urban cuts »,…), the main assets are found within the spaces of the footpaths (atmosphere, services, « urbanity »,…). The recommendations consist in several proposals for a creation of a « rail station square », grouping and facilitating every modal connections (tram, bus, bicycle, train); spatial solutions to limit « urban cuts » between the station and its environment; architectural solutions to make the station more « readable »; a research of complementarities between services « near » the station and those encountered on the footpaths.
- At Le Clapier, the situation appears, to a certain extent, as opposite to the former one: the main problems concern the footpaths (principally near the station: lack of services, of fluidity, of security,…), the main assets are relative to the station itself (architecture, readability, …). The recommendations consist in several proposals for taking advantage of architectural assets of the station by correcting its deficiencies in terms of lack of services as well as completing the excellent existing visual relation between « the station » and « the city » by improving the « physical » relation (fluidity, security,…).

Concept development in German reference site

Mismatching of settlement structures and railway station locations

Along the Taunusbahn – as in many regional railway corridors – the location of railway stations doesn't always match with the most important destinations of the train user (schools, job concentration,…). The municipalities along the line therefore are asked to develop successful strategies in improving the interconnection between the urban locations and the station – especially in non-motorised transportation.

Four municipalities within the German Bahn.Ville project have agreed to develop integrated neighbourhood mobility concepts with respect to the Taunusbahn as a backbone of the regional corridor. The potentials and challenges from these case-studies are assessed in order to dress up general conclusions and to give recommendations reaching beyond the local application.

The assessment of strategies can rely on a very detailed accessibility measurement and visualisation, providing network based travel times in walking and cycling (see Mercier/Stoiber 2020 for further details). It would be interesting to integrate to these accessibility measurements the level of quality as an important, qualitative perception factor.

Also, in the German case study investigations on user's perception have been implemented, analysed and taken into account for sustainability estimates.

User participation in Usingen

Usingen is one of the locations, where specific concepts and processes have been developed within the Bahn.Ville project in order to improve the situation for non-motorised trips in the station surrounding.

Firstly, a group of school kids have been invited to a workshop in order to point out the daily observations, assets and shortcomings: Dangerous crossings as well as two small footpaths towards the station have been major complaints. Secondly, in cooperation with a local consultancy and manifold local stakeholders, a first concept scheme has been elaborated (see figure 4). A key proposition is to improve the quality of the station square – not only as a transport hub with local busses, but also as an attractive urban location enabling intuitive orientation.

The Bahn.Ville project also has contributed to the revival of the discussion on a bridge project over the rail site in order to link a major activity zone not well connected today (also

for safety reasons). Accessibility measurement and evaluation are well suited to that issue, also in order to judge on the spatial impacts and the potential ridership.

As a result, a framework program for local policy decisions and implementation is developed.

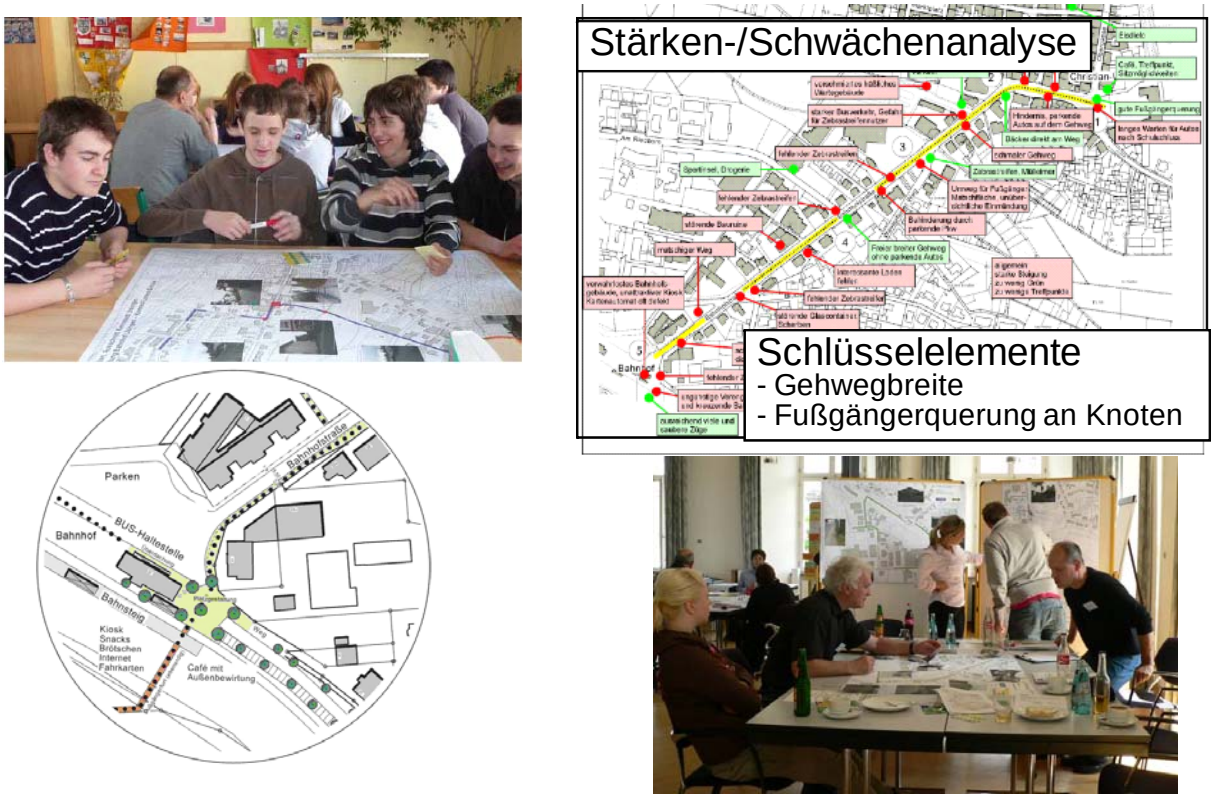

Figure 4: Citizen's Participation and expert workshops help to define strategic elements of neighbourhood mobility concepts (Source/Photos: Pretsch 2009)

French-German conclusions

The investigations in both case-studies have shown a high consistency in major issues for high quality neighbourhood mobility. As a common result, it can be stated that pedestrians need continuity in their walking and prefer animated locations. The five criteria dressed from the French observations (Atmosphere, Fluidity, Security, Service and Readability) are confirmed by the German analysis. They all have to be met. If one of the 5 criteria is not fulfilled, the pedestrians won´t feel comfortable and probably won´t walk but prefer other means of transportation. The result of the survey done in German municipalities highlights that if one single section of the pedestrian route has a bad image it gives a negative connotation to the whole route. Reciprocally a positive perception of one single section does not lead to a positive perception of the whole route.

Some planning principles can be deducted and confirmed, like

- Reduce the dead-ends of station, station of 360 degree,…
- Animation of the public spaces to make it attractive, …

LAND-USE OBSERVATORY

A joint observation of land and transport

We will present an implementation of an observation tool on land and transport. This tool is built to be used by public authorities in a decision making context. The tool takes the form of a joint observation system of land and transport with specific indicators in each domain and some indicators mixing the two.

From a practical point of view, the implementation of an observation system, associating several actors, producers and users of data, is preferable to an isolated observatory. Observation of these two domains supposes sharing data.

Beyond the basic information that any public actor manages to define its own strategy, there is room for setting up shared observation tools that allow for mutualisation of observation means and for the development of a common language between partners that will constitute the base for their common investigations and diagnostics (Comby, 2004).

An observation system must also be associated with a strong political drive (to guarantee its sustainability), with precise and realistic objectives (adequacy between aims and available means), with up to date and updatable data (a static and not evolving information proves to be hardly usable and quickly erroneous), with relevant territory definition and spatial scales of observation.

The joint land and transport observation system must comply with these principles and fill in three main objectives. It aims at:

- informing the actors in the domains of land management and transport of the situation on the territory;
- allowing for the evolution of the urban projects around stations through interaction between the various fields of competence involved by transport and land use;
- alerting the actors of urban planning of the occurrence of possibilities for evolution of land use.

The main objective is to reveal and to analyse the potential for use development in relation with urban and railway developments.

This can allow for the identification of land opportunities to support urban renewal. It is then possible to oppose the commonly accepted idea that "the peri-urban expansion is an unavoidable phenomenon and the urban planning (urbanism) is impotent when confronted to such a blind roller" (Kaufmann and Jemelin, 2003, p. 330).

Facing the present issues of urban sustainable development and urban renewal, a possible way resides in the development of a railway orientated urbanism. But in order to favour the public transport over cars, it is not sufficient to only increase the transport supply, but an action towards the limitation of the surface dedicated to cars is necessary, through a reduction of car parks for instance. The idea is to oppose the "vicious circle where urban growth is associated with the road network that reinforces the use of automobile. This utilisation is then rooted in the way of life and leads investors and households to favour locations easily reachable by car" (ibid, 1)

.

To obtain sound results it is necessary to support the consistency of public transport supply, of the management of road accessibility and of the articulation between urbanisation and the development of public transport (Kaufmann et Jemelin, 2003). To deal with these issues, a joint land and transport observation is necessary.

Establishing perimeters for observation

For a relevant observation it is first of all necessary to define adequate observation perimeters. In the Bahn.Ville approach two perimeters were established:

- A buffer zone: a disk centred on the station with a fixed radius. It allows to compute the maximum theoretical potential accessible land (with a distance as the crow flies and a given speed)
- An isochrone: a perimeter based on network distance that matches the reality of mobility constraints (computation based on the layout of the network and a mean speed). This perimeter permits to determine the really accessible land.

The reference points for these two perimeters are the railway stations. From these two methods two perimeter are built: a pedestrians perimeter and a public transport perimeter, each based on a distance, a mean speed and a reference duration:

- A pedestrian speed: 5 km/h which corresponds to someone walking rapidly towards the station on a footpath he/she knows well and use to practise.
- A public transport speed: a mean speed of 15 to 20 km/h according to the urban fabric (respectively dense and peripheral).
- A duration: 10 minutes is the most frequent duration for egress trips to the station whatever the transport mode.

When implemented the method gives the following figures:

- A walkable perimeter of 800 meters around stations (the distance travelled in 10 minutes at 5 km/h gives 833 meters)
- A public transport perimeter of 2,5 km in the dense urban fabric.

The buffer zones are determined according to these principles. The public transport isochrones are based on a duration of 15 minutes to introduce the additional walking time and mean waiting time for the public transport vehicle. It must be noticed that computation concerning public transport are based on timetable information[1].

[1] These computation are based on shortest path algorithm with timetables implemented in a GIS-transport software: MapNod, available for downloading at http://mapnod.free.fr/

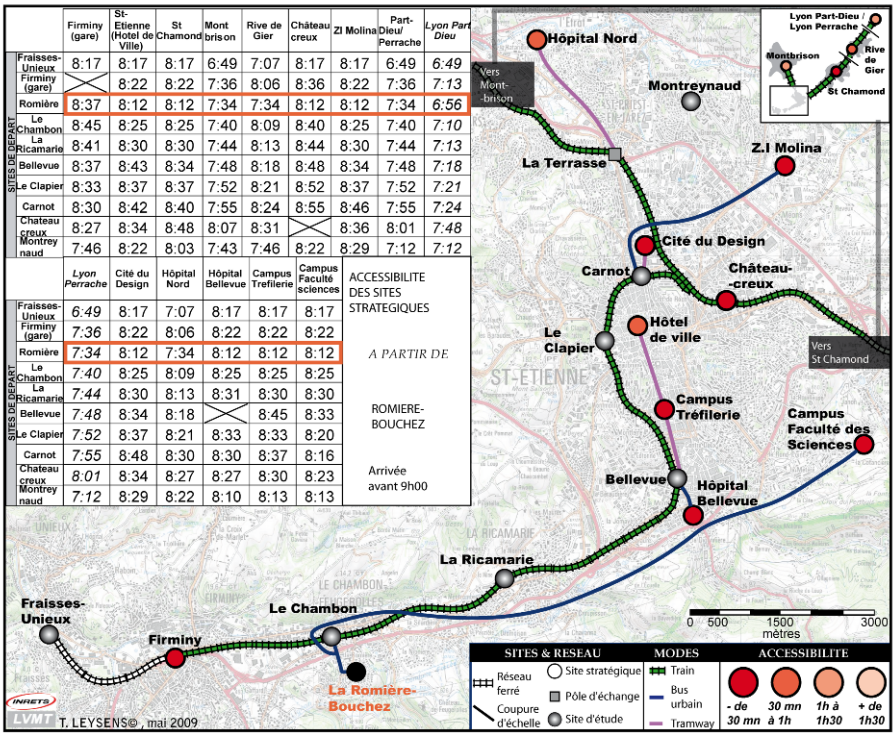

Figure 5: Timetable accessibility measure from the area of La Romière to strategic locations in the urban region of St-Etienne. Realisation: T. Leysens, 2009

The map shows the accessibility (timetable, path and transport modes) to strategic sites (employment sites, study sites, commercial poles, etc.) from an area subject to urban renewal policy, the area of La Romière Bouchez, located in the commune of Le Chambon on the St-Etienne-Firminy railway line. The measure considers an arrival before 9h00 to all strategic sites. The map depicts the transport modes and the paths. In addition a table gives all the departure times from La Romière and from a series of sites located at proximity of Le Chambon in order to develop a comparison.

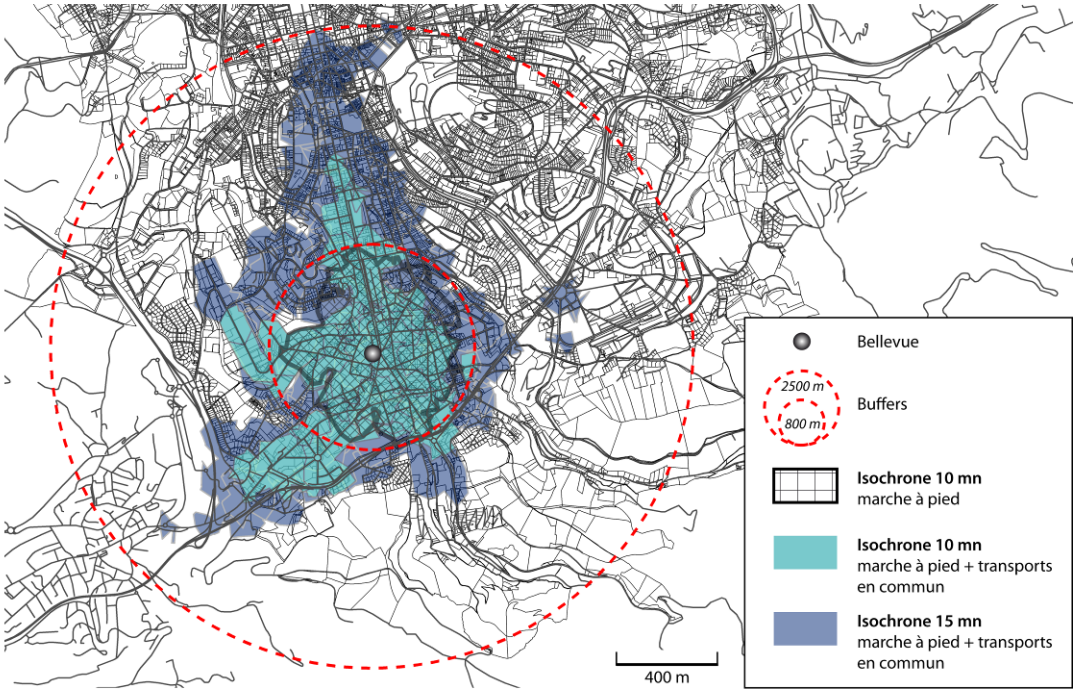

Figure 6: Perimeter and pedestrian and public transport isochrones around the station of Bellevue, St-Etienne; with cadastre background for the real estate analyses. Realisation: T. Leysens, 2009

The perimeter built from a GIS, are superimposed on a land registry map in order to determine the pieces of land that represent a potential for an urbanisation around the railway station. The gap between the potential accessibility indicated by the buffer, and the real accessibility given by the isochrone highlights the pieces of land of interest for urban densification, in case of an improvement of accessibility.

Observing, simulating, alerting.

The implementation phase has shown that the observation system supposes the combination of three functions to cover all the needs expressed by public institutions engaged in an urban project orientated towards rail. A series of indicators dealing with land and transport is attached to each function.

The observation function has for aim to tackle the following questions:

- What are the demographic and economic trends (number of households, of employments, of activities, services, etc.)?
- What is the evolution of the transport network (transport supply, patronage, accessibility, quality of service)?
- What are the land use, real estate and renewal dynamics (land sales, housing sales, vacant housing, renewal operations)

The simulation function has for aim to foresee:

- The increase of land development potential provoked by an improvement of accessibility.

- The potential urban densification around stations

The alert function must allow detecting:

- Pieces of land subject to mutation and/or characterise by high land use potential.
- The articulation problems raised by modifications of railway supply and urban transport supply

In order to illustrate these various functions here are some indicators tested in the St-Etienne urban region here around the Bellevue Station:

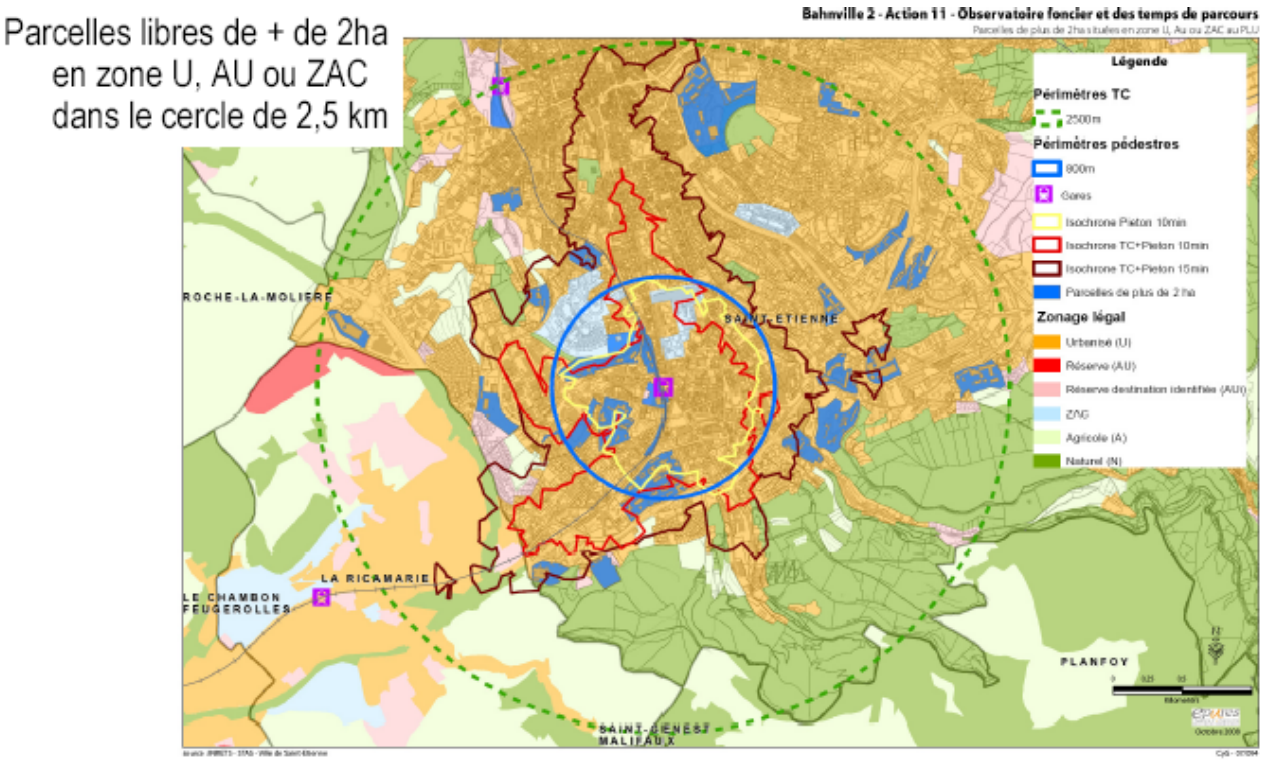

Figure 7: Vacant pieces of land of more than 2 hectars in « urbanisable » zoning (U, AU ZAC according to land use plan PLU) located inside the 2,5 km buffer around Bellevue St-Etienne station Realisation: Epures (Agence d'urbanisme de la région stéphanoise), 2009

The map shows pieces of land of interest in the aim of urban densification around station. It is an illustration of a joint analysis of land and transport.

CONCLUSIONS

Sustainable mobility by integrated approaches in rail-oriented development

The vision: Sustainability

The innovative regional planning tools, the neighbourhood mobility concepts as well as the setting up of an observation tool for public intervention in stations areas constitute three original contributions of the Bahn.Ville 2 project in the sense of the support sustainable mobility by an urbanism orientated towards rail.

There is a general interest in the potential of rail-oriented development to sustain in a phase of transition and crises, facing manifold risks and uncertainties like energy scarcity, peak oil, climate change, economic crisis and household budget risks (cf. Wulfhorst, 2010).

Two scales of action … region and local

The investigations presented as well as the experience in the two French and German reference sites have shown, that there are two key spatial scales to be addressed by integrated planning. That is the regional scale for strategic integration of land-use and transport as well as the local level for a more detailed and precious implementation of coordinated measures.

Towards a design of successful implementation processes

The theory of integrating land-use and transport around the railway axis of urban regions has been developed at least since the 1960's (cf. Hamburg Finger model). The challenge is to promote successful instruments and processes of implementation in times where regulation by strong regional planning seems to become more and more unrequested.

One of the main questions to be discussed therefore is how public authorities keep on managing the processes of planning and realisation.

Added value of French-German collaboration

France and Germany can learn a lot from each other in integrated land-use and transport development, … learning from errors as well as from best-practices. And this is true not only on the level of high speed rail research and technological development or on the "tramway renaissance" (cf. Groneck 2007).

French planning and funding strategies for example show a high degree in integration (design of transport facilities and urban design, integration of spatial policies, …), perhaps the conditions for implementation afterwards are less strict.

German planning traditions show a high degree in land-use and transport integration, but the project management and funding schemes stay rather sectoral; that is why the decision making processes often still lack a strong intermodal or interdisciplinary perspective.

From our point of view, it is worth going on in this kind of joint research initiatives.

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